

Liquid Versus Salt



M1-5 CHEMISTRY

Testable Question & Purpose

Question: Which liquid dissolves salt the quickest?

Purpose: The purpose of this experiment was to use the results to come to a conclusion on why the same amount of salt tends to have a more distinct taste in different dishes where water, vegetable oil, or vinegar is of a bigger proportion.

Abstract

The problem I wanted to test was why salt was more distinct in foods with more of a certain liquid. This was the purpose of my experiment. I tested whether water, vinegar, or vegetable oil would dissolve salt the quickest. This is because if the salt does not dissolve, it is more distinct in the food. My hypothesis was that vinegar would dissolve salt the fastest because it is mostly water which other chemicals that could break down the salt better. Once I gained my materials, I made 2 papers with circles set in a 2 by 6 array, each 2 inches apart from each other. I set up the cups on the papers and poured the measured amount of salt into each cup, then the liquid. I left the cups out for 4 days and at that point I realized the salt was not going to dissolve entirely. In the cups with water, the salt started to form into sheets and in a way, salt crystals. The cups with vinegar had bubbles all around the inside of the cup and the cups with vegetable oil had no change. The salt simply sat in the cups of oil. I came to a conclusion on which one I think would dissolve salt the quickest if my experiment would have worked. Since I didn't get definite results, I therefor cannot come to a final conclusion.

Hypothesis

If water is a “universal solvent” and vinegar is about 95% water, with 5% acetic acid, then it will have the same effect on the salt, but quicker than water because of the acetic acid.

Materials

- Distilled White Vinegar (32 FL oz.)
- Purified Water (4 bottles of 16 FL oz.)
- Vegetable Oil (48 FL oz.)
- Solo Clear Plastic Cups (36 count, 10oz.)
- Stopwatch app
- Measuring cup for $\frac{1}{2}$ cup and $\frac{1}{4}$ cup

Procedures

1. Set 12 cups on flat surface, arranged in 2 rows of 6, each spaced 2 inches apart from the sides.
2. Pour $\frac{1}{4}$ cup (2 ounces) of salt into each cup.
3. Pour $\frac{1}{2}$ cup (4 ounces) of water into one cup and start the stopwatch right when liquid is poured.
4. Stop the stopwatch when there are no grains of salt left in the cup.
5. Record the time elapsed of the salt's dissolution.
6. Repeat steps 3 and 4 for each cup until all of the 12 cups have been used.
7. Repeat steps 1 through 5 for vinegar, and once more for vegetable oil.

Variables

Constants: amount of liquid, amount of salt, temperature, size/type of cups

Independent: type of liquid

Dependent: amount of time of the dissolution of the salt

Results

I do not have a chart for my experiment because none of the cups of salt entirely dissolved. I noticed that the cups with water had lowest salt levels, but I cannot be sure that water is the quickest solvent. The cups with water had a bit less than half of the salt left after 4 days. The cups with vinegar had a little bit above half of salt after 4 days. The salt in oil did not dissolve at all.

Conclusions

My hypothesis was not supported because the salt did not entirely dissolve in any liquid of my experiment. Although I was correct on how the salt would most likely not dissolve in oil, I was incorrect that vinegar would dissolve the salt the quickest. I think water may have dissolved salt the quickest, but I cannot be sure.

Works Cited

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